

Akutni koronarni sindrom u Republici Hrvatskoj

Acute Coronary Syndrome in Croatia

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SAŽETAK: Hrvatska u području liječenja akutnoga koronarnog sindroma metodama intervencijske kardiologije (perkutane koronarne intervencije, PCI) vrlo usko prati svjetske rezultate unatoč relativno niskim ulaganjima u zdravstveni sustav u usporedbi s razvijenim zemljama. U posljednjih desetak godina, otkada postoji Hrvatska mreža primarne PCI, hitno je liječeno nešto više od 15 000 bolesnika s akutnim infarktom miokarda s elevacijom ST segmenta (STEMI), a, prema istom principu, liječe se i drugi bolesnici s nestabilnim akutnim koronarnim sindromom. U posljednjim godinama mreža zbrinjava oko 540 – 550 bolesnika s akutnim STEMI-jem na milijun stanovnika, a svaki od jedanaest PCI centara koji rade na principu 24/7 zbrinjava prosječno nešto više od 384 000 stanovnika. Prema trendovima zadnjih deset godina, jasan je porast rizičnoga profila tih bolesnika uz održavanje rezultata liječenja na razinama komparabilnima s onima sličnima PCI mrežama (postproceduralni TIMI III protok do 91 %, unutarbolnički mortalitet od 4,4 do 6,3%). Budući su planovi razvijanje kontinuiranoga prospektivnog elektroničkog Registra invazivne i intervencijske kardiologije te akutnoga koronarnog sindroma, daljnje skraćivanje reperfuzijskih vremena, daljnje povećanje uvođenja optimalnih lijekova i materijala u liječenje ovakvih bolesnika te optimizacija liječenja i akutnog infarkta miokarda bez elevacije ST segmenta na cijelom području Republike Hrvatske.

SUMMARY: In the field of acute coronary syndrome management by the methods of interventional cardiology (percutaneous coronary intervention, PCI), Croatian medicine has closely followed international results in spite of the relatively low investments in the Croatian healthcare system as compared with industrialized countries. Since the establishment of the Croatian Primary Percutaneous Coronary Intervention Network, i.e. in the last decade, more than 15,000 patients with acute myocardial infarction with ST-segment elevation (STEMI) were treated with PCI; the same treatment protocol has also been applied in other patients with unstable acute coronary syndrome. In recent years, the network has managed 540-550 patients with acute STEMI per million inhabitants, with each of the eleven PCI centers providing care for more than 384,000 catchment population through 24/7 work schedule. The trends observed in the past decade show the risk profile of these patients to increase, while maintaining the results of treatment at the levels comparable to those reported from similar PCI networks (postprocedural TIMI III flow up to 91% and in-hospital mortality ranging from 4.4% to 6.3%). Future plans include development of a continuous prospective electronic Registry of Invasive and Interventional Cardiology and Acute Coronary Syndrome, further reduction of reperfusion time, increasing introduction of optimal medication and materials in the treatment of these patients, and optimization of treatment of acute myocardial infarction without ST-segment elevation all over Croatia.

KLJUČNE RIJEČI: akutni koronarni sindrom, intervencijska kardiologija, Republika Hrvatska.

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Uvod

Malo je područja u modernoj medicini koja su doživjela takav uzlet kao terapija akutnoga koronarnog sindroma u posljednjih petnaestak godina. Razvoj moderne intervencijske kardiologije

Introduction

There are few fields in medicine that have made such a breakthrough as the management of acute coronary syndrome in the past fifteen years. Development of modern interventional cardiology

tijekom 2000-tih doveo je do sniženja unutarbolničkog mortaliteta u akutnom infarktu miokarda do razine od oko 5 %. S obzirom na složenost formiranja i organizacije službe percutane koronarne intervencije (PCI), osobito na 24/7 bazi, u zdravstvenim ustanovama, moderne metode liječenja na početku su bile dostupne samo ograničenom broju ljudi, tj. samo onima koji su živjeli ili su se u vrijeme koronarnog incidenta zatekli u blizini PCI centara. Tijekom prvog desetljeća ovoga stoljeća etabrirana je i znanstveno dokazana ideja o mogućnosti hitnoga transporta bolesnika s akutnim koronarnim sindromom u PCI centre, osobito one visokovolumne, uz živahno razdoblje organiziranja mreža primarne PCI u nastavku, prvo u europskim zemljama, a potom i drugdje.¹⁻⁵ Time se broj optimalno zbrinutih bolesnika s akutnim koronarnim sindromom dramatično povećao, a samim tim je i kvaliteta zdravstvene zaštite porasla. Nadalje su se počeli razvijati tzv. *fast-track* protokoli sa zaobilazanjem općih bolnica u blizini i transportom bolesnika izravno u PCI centre, naglašavana je važnost što ranijeg snimanja i analize 12-kanalnog EKG-a (unutar prvih deset minuta od prvoga medicinskog kontakta), preporučivane su razne metode skraćivanja *door-to-balloon* vremena te provođene javnozdravstvene akcije u svrhu smanjenja *pain-to-door* vremena. Također, prati se rast i razvoj kvalitete materijala koji se rabe u intervencijskoj kardiologiji, kao i rasvjetljavanje nekih od nepoznanica s početaka intervencijskog liječenja (npr. trombaspiracija, mjesto GPIIb/IIIa, prednosti transradijalnoga pristupa i slično). Vrlo burno bilo je i na području farmakoterapije akutnoga koronarnog sindroma pa je plejada lijekova u antiagregacijskoj terapiji sve jača i učinkovitija.⁶⁻¹³

Liječenje akutnoga koronarnog sindroma u Republici Hrvatskoj

Kao u možda tek nekoliko područja u modernoj medicini, Hrvatska je u području liječenja akutnoga koronarnog sindroma metodama intervencijske kardiologije vrlo usko pratila svjetske rezultate. Za početak treba napomenuti da je brutodomaći proizvod (BDP) po stanovniku u Hrvatskoj 2013. godine iznosio oko 13.500 USD svrstavajući je među najsiromašnije zemlje Europske unije, a izdvajanja za zdravstvo iznosila su 7,3 % BDP-a. Unatoč navedenim, u usporedbi s razvijenim zemljama, niskim ulaganjima u zdravstveni sustav, Hrvatska je pratila trendove te je već sredinom 2000-tih imala nekoliko etabliranih PCI centara sa začetcima sustava 24/7. Ideja o razvoju PCI mreže koja bi, pogotovo uzimajući u obzir geografska obilježja Hrvatske, podigla dostupnost primarne PCI i sazrijevala je u prvim godinama ovog tisućljeća. Osnivanjem Radne skupine za akutni koronarni sindrom Hrvatskoga kardiološkog društva 2004. godine, izradom projekta razvoja mreže PCI centara kojima će se osigurati hitno liječenje akutnoga koronarnog sindroma metodama intervencijske kardiologije na svim područjima Republike Hrvatske te njegovo prihvaćanje od Ministarstva zdravstva Republike Hrvatske stvorilo je preduvjete da od 2005. god. mreža primarne PCI počne funkcionirati. Osnovni cilj formiranja mreže primarne PCI bio je osiguranje jednake razine liječenja akutnog infarkta miokarda za sve stanovnike Republike Hrvatske, a osnovni principi njezina razvoja bili su postupna implemen-

during the 2000s has reduced in-hospital mortality in acute myocardial infarction to around 5%. Because of the complex establishment and organization of the percutaneous coronary intervention (PCI) service at healthcare institutions, especially based on 24/7 work schedule, current methods of treatment were at the beginning available only to a limited number of patients, i.e. those living or happening to be in the vicinity of a PCI center. In the first decade of this century, the concept of emergency transportation of patients with acute coronary syndrome to PCI centers, in particular high-volume ones, emerged and was scientifically verified, followed by the lively period of organizing primary PCI networks, at first in European countries and then also elsewhere¹⁻⁵. These efforts have dramatically increased the number of optimally managed patients with acute coronary syndrome, thus also upgrading the quality of healthcare in general. Then, the so-called fast-track protocols have been launched, avoiding nearby general hospitals and transporting patients directly to PCI centers, emphasizing the importance of the earliest possible 12-lead electrocardiogram (ECG) analysis (within ten minutes of the first medical contact), suggesting various methods to reduce the door-to-balloon time, and launching public health actions to reduce the pain-to-door time. In addition, development and improvement of the materials used in interventional cardiology have been carefully monitored, along with efforts invested to elucidate some unknowns from the beginnings of interventional therapy (e.g., thrombaspiration, the role of GPIIb/IIIa, advantages of transradial approach, etc.). Pharmacotherapy of acute coronary syndrome has also been through quite a tumultuous period, with ever broader and more efficient array of drugs used in antiaggregation therapy⁶⁻¹³.

Treatment of Acute Coronary Syndrome in Croatia

In the field of acute coronary syndrome management by the methods of interventional cardiology, Croatia has very closely followed international results as one of only few fields in modern medicine. It should be noted that gross domestic product (GDP) in Croatia in 2013 was around 13,500 USD, ranking it among the poorest European Union countries, with 7.3% GDP public health allocations. In spite of these facts as compared with developed countries, Croatia succeeded to keep pace with the world trends and had a number of PCI centers initiating 24/7 work schedule established as early as the mid-2000s. The idea of developing a PCI network in order to enhance primary PCI availability, in particular taking into account the Croatian geographical specificities, was building up in the first years of this millennium. Upon appointment of the Task Force for Acute Coronary Syndrome of the Croatian Society of Cardiology in 2004 and launching the project of PCI center network to ensure urgent management of acute coronary syndrome by the methods of interventional cardiology all over Croatia and its acceptance by the Ministry of Health of the Republic of Croatia, due preconditions were met for the primary PCI network to start working in 2005. The main goal of establishing the primary PCI network was to provide equal levels of treatment for acute myocardial infarction to all inhabitants of Croatia, while the basic principles of its development were gradual network implementation in the national healthcare system, even development of PCI centers in all parts

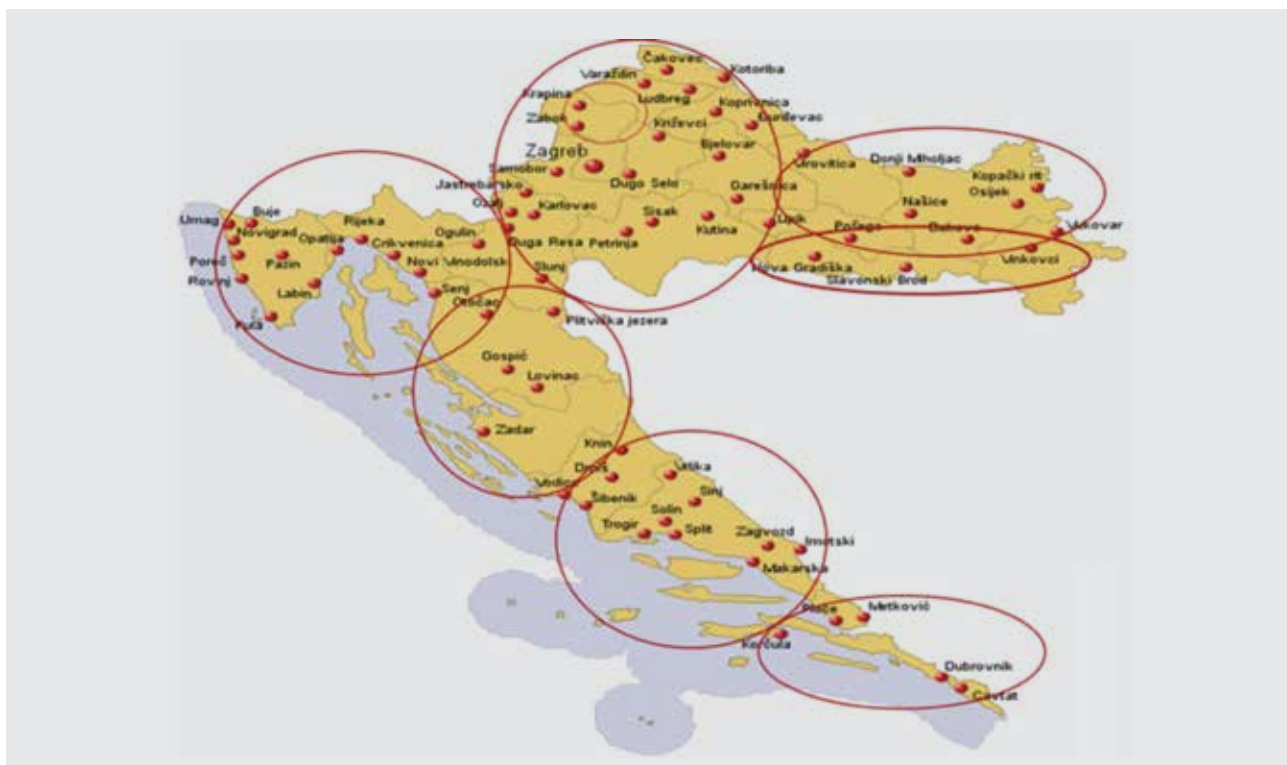


FIGURE 1. Croatian Primary Percutaneous Coronary Intervention Network.

tacija u zdravstveni sustav, ravnomjerni razvoj PCI centara u svim dijelovima Republike Hrvatske te kontinuirana međusobna komunikacija svih sudionika mreže na svim razinama zdravstvene zaštite. Danas je Hrvatska mreža primarne PCI duboko ukorijenjena u hrvatski zdravstveni sustav i funkcionira kao sprega regionalnih PCI centara, županijskih i općih bolnica koje tim centrima gravitiraju te sustava hitne medicinske pomoći.¹⁴⁻¹⁵

U posljednjih deset godina, otkako postoji, unutar okvira cijele Hrvatske mreže primarne PCI (**slika 1**), hitno je liječeno nešto više od 15 000 bolesnika s akutnim infarktom miokarda s elevacijom ST segmenta (STEMI), a, po istome principu, liječe se i drugi bolesnici s nestabilnim akutnim koronarnim sindromom. U posljednjim godinama mreža zbrinjava oko 540 – 550 bolesnika s akutnim STEMI na milijun stanovnika (**slika 2**), što se postupno približava optimalnomu broju od najmanje 600 primarnih PCI-ja na milijun stanovnika i svrstava nas uz bok najrazvijenijih zemalja Europe i svijeta. Dok u europskim zemljama jedan PCI centar zbrinjava prosječno između 31 300 i 6 533 000 stanovnika, u Hrvatskoj svaki od naših jedanaest PCI centara koji rade po principu 24/7 zbrinjava prosječno nešto više od 384 000 stanovnika, što je unutar optimalnih granica. Prema kretanjima zadnjih 10 godina, jasan je porast rizičnoga profila bolesnika liječenih zbog akutnog STEMI-ja unutar Hrvatske mreže primarne PCI: dobi (sa 60 godina u prvoj fazi na 63 godine u zadnjem razdoblju), ženskoga spola (s 27 na 31 %), učestalosti bolesnika sa slikom kardiogenog šoka (sa 6,7 na 7,6 %) i drugih (zahvaćenost prednje stijenke lijeve klijetke, debila lijeve koronarne arterije, prenosnica i sl.). Unatoč navedenom povećanju rizičnoga profila, broja bolesnika liječenih u

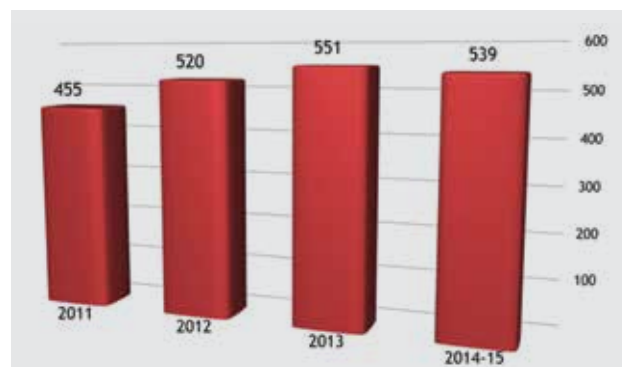


FIGURE 2. Number of patients with acute ST-elevation myocardial infarction treated with primary percutaneous coronary intervention per million inhabitants of Croatia.

of Croatia, and continuous communication among the network members at all healthcare levels. Nowadays, the primary PCI network has been deeply rooted in the Croatian healthcare system, functioning through collaboration among regional PCI centers, catchment county hospitals and general hospitals, and emergency medicine service^{14,15}.

In the past ten years of the Croatian Primary PCI Network existence (**Figure 1**), more than 15,000 patients with acute myocardial infarction with ST-segment elevation (STEMI) underwent urgent treatment using the methods of interventional cardiology, and other patients with unstable acute coronary syndrome being also managed by the same treatment protocol. In recent

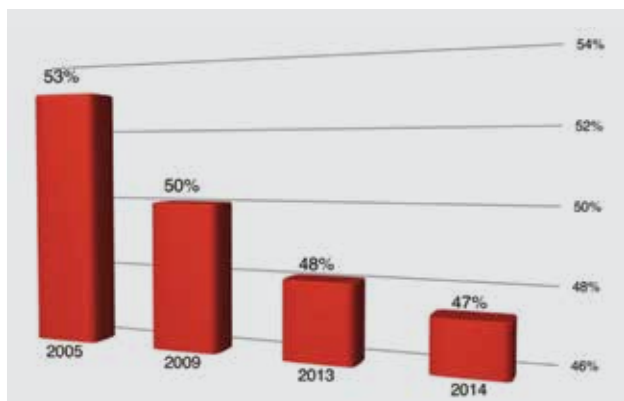


FIGURE 3. Cardiovascular mortality in Croatia.

akutnom STEMI-ju te ulaska novih centara u sustav mreže primarne PCI tijekom vremena se povećava udio postignutog optimalnog TIMI III protoka na kraju postupka (s 87 na 91 %), dok mortalitet stagnira u rasponu od 4,4 do 6,3 %. Takvi su rezultati, zasigurno, jedan od važnih razloga što se u posljednjih deset godina prati pad smrtnosti od koronarne bolesti srca te kardiovaskularna smrtnost uopće u Hrvatskoj (**slika 3**). Prethodno navedeni podatci usporedivi su s rezultatima sličnih mreža primarne PCI na regionalnoj i nacionalnoj razini zemalja s bitno većim BDP-om i većim ulaganjima u zdravstveni sustav, zbog čega je Hrvatska mreža primarne PCI prepoznata u relevantnim kardiološkim krugovima, a njezini rezultati objavljeni su u znanstvenim i stručnim medicinskim časopisima.¹⁶⁻²¹

Budući planovi

Dosadašnje retrospektivno sakupljanje podataka o hrvatskim rezultatima intervencijskog liječenja akutnog infarkta miokarda, osobito onoga sa ST elevacijom, koje je u dvogodišnjim razdobljima organizirala Radna skupina za akutni koronarni sindrom Hrvatskoga kardiološkog društva, odgovara retrospektivnim diskontinuiranim registrima koji su obično međukorak u stvaranju optimalnih kontinuiranih prospektivnih registara. Takvi registri osiguravaju laku dostupnost podataka, kao i praćenje trendova u vezi s bolestima i drugim pojavama koje ih prate, pa tako i akutnoga koronarnog sindroma.²²⁻²⁴ Od 2015. godine Radna skupina za akutni koronarni sindrom i Radna skupina za intervencijsku kardiologiju Hrvatskoga kardiološkog društva zajedno s Agencijom za kvalitetu i akreditaciju u zdravstvu i socijalnoj skrbi surađuju na razvijanju kontinuiranoga prospektivnog Registra invazivne i intervencijske kardiologije te akutnoga koronarnog sindroma koji će se elektroničkim putem ispunjavati podacima o bolesnicima liječenima metodama intervencijske kardiologije u PCI centrima širom Republike Hrvatske, pa tako i onima liječenima pod dijagnozom akutnoga koronarnog sindroma. Dosadašnje organizacijske predradnje i ciljevi Registra već su predstavljeni na skupovima hrvatskih invazivnih i intervencijskih kardiologa, a implementacija navedenog registra očekuje se do kraja 2016. godine. Premda će i taj registar direktno i indirektno davati niz podataka o liječenju akutnoga koronarnog sindroma u Republici Hrvatskoj, mnogi podatci njime neće biti obuhvaćeni (npr. postotak fibrinoliziranih ili nereperfundiranih bolesnika

years, the network has managed 540-550 patients with acute STEMI per million inhabitants (**Figure 2**), approaching the optimal figure of at least 600 primary PCIs per million inhabitants, ranking Croatia side by side with the most developed countries in Europe and the world. In European countries, one PCI center has a catchment population of 31,300-6,533,000 on average, whereas each of the eleven PCI centers in Croatia with 24/7 work schedule has a catchment population of 384,000 inhabitants, which is within the optimal limits. According to records on the past ten years, there is an overt increase in the risk profile of patients treated for acute STEMI in the Croatian Primary PCI Network, as follows: patient age (from 60 years in the beginning to 63 years in recent years); female sex (from 27% to 31%); prevalence of patients presenting with cardiogenic shock (from 6.7% to 7.6%); and other (involvement of the left ventricular anterior wall, left coronary artery trunk, bypasses, etc.). In spite of the above mentioned increase in the patient risk profile, number of patients treated in acute STEMI and a number of new centers having joined the Primary PCI Network, the proportion of optimal TIMI III flow achieved at the end of the procedure has increased with time (from 87% to 91%), with the mortality rate ranging from 4.4% to 6.3%. These results certainly are one of the major reasons for a decreasing trend recorded in the mortality from coronary heart disease, as well as in the overall cardiovascular mortality in Croatia in the past ten years (**Figure 3**). The results reported above are comparable with those from similar primary PCI networks at the regional and national levels in countries with a substantially higher GDP and greater healthcare investments. That is why the Croatian Primary PCI Network has been recognized in relevant cardiological settings, and its results have been published in renowned scientific and professional medical periodicals¹⁶⁻²¹.

Future Plans

Retrospective data collection on the Croatian results achieved with interventional management of acute myocardial infarction, STEMI in particular, performed biannually by the Working Group for Acute Coronary Syndrome of the Croatian Society of Cardiology, corresponds to retrospective discontinuous registries usually established as an interim solution in the process of developing optimal continuous prospective registries. Such registries facilitate data accessibility and monitoring trends related to diseases and other associated events, also applicable to acute coronary syndrome²²⁻²⁴. Since 2015, the Working Group for Acute Coronary Syndrome and Working Group for Interventional Cardiology of the Croatian Society of Cardiology in collaboration with the Agency for Quality and Accreditation in Healthcare and Social Welfare work on the development of a continuous prospective Registry of Invasive and Interventional Cardiology and Acute Coronary Syndrome. Data on patients treated by the methods of interventional cardiology in PCI centers all over Croatia, including those treated with the diagnosis of acute coronary syndrome, will be entered electronically in the Registry. The preliminary organizational activities and aims of the Registry have already been presented at conferences of the Croatian invasive and interventional cardiologists. Full implementation of the Registry is expected by the end of 2016. The Registry will provide a series of data on the management of acute coronary

s akutnim STEMI-ijem, terapija i rezultati liječenja bolesnika s akutnim koronarnim sindromom koji nisu liječeni metodama invazivne i intervencijske kardiologije i sl.). Takve će podatke dati tek Registar akutnoga koronarnog sindroma koji će, osim PCI centara, obuhvatiti i sve druge bolničke ustanove u Republici Hrvatskoj i koji mora biti dugoročni cilj.

Prema podacima postojećeg Registra, broj infarkta miokarda bez ST elevacije liječenih metodama intervencijske kardiologije unutar prvih nekoliko sati do dana nakon koronarnog incidenta zaostaje za onim u STEMI-ju, što se osobito odnosi na bolnice bez mogućnosti takvog liječenja i neminovno utječe na morbiditet i mortalitet takvih bolesnika. Uzroci takvoga stanja uglavnom su financijske prirode i u perspektivi treba poduzimati akcije za njegovu promjenu.

Osim navedenoga, mjesta za napredak ima i u području organizacije transporta unutar mreže. Tako primjerice *fast-track*, osim u Istarskoj i Krapinsko-zagorskoj županiji, uglavnom ne funkcionira te bolesnici u akutnoj fazi infarkta miokarda gube dragocjeno vrijeme na vožnju prema bolnicama koje im ne mogu pružiti hitno intervencijsko liječenje. Također, u većini slučajeva nije dostupna analiza 12-kanalnog EKG-a već pri prvom medicinskom kontaktu, tj. u kolima hitne medicinske pomoći na terenu ili ordinaciji opće medicine, čime se također nepotrebno gubi vrijeme za postavljanje dijagnoze i započinjanje liječenja ovoga nerijetko životno ugrožavajućega stanja. U smislu korekcije ovakvih nelogičnosti Radna skupina za akutni koronarni sindrom sudjeluje u trajnoj edukaciji o ovome problemu liječnika sudionika mreže u svim dijelovima Republike Hrvatske. U tom je smislu tijekom 2015. i 2016. godine izrađen i jednostavni grafički Postupnik dijagnostike i liječenja akutnog infarkta miokarda (**slika 4** na engleskom jeziku; na hrvatskom jeziku Postupnik preuzeti s http://www.kardio.hr/pdf/Postupnik_za_web.pdf) koji se distribuira u zdravstvene ustanove širom Republike Hrvatske.

Zadnju godinu dana postignut je značajan iskorak na polju dostupnosti moderne antitrombotične terapije u Republici Hrvatskoj. Kao što je poznato, prasugrel i tikagrelor danas su antiagregacijski lijekovi izbora u liječenju akutnog infarkta miokarda.⁸⁻¹¹ I dok prvi nije prisutan na hrvatskome tržištu, tikagrelor je od prošle godine dostupan bez naknade bolesnicima sa STEMI infarktom liječenima primjenom PCI u prvih šest mjeseci, čime je njegova penetracija u STEMI infarktu u Republici Hrvatskoj porasla s 52 % u prvoj polovici 2015. godine na 79 % u prvoj polovici 2016. godine. Takvi rezultati za antiagregacijski lijek treće generacije u STEMI-ju odgovaraju najbogatijim europskim zemljama. Međutim, kako nakon šest mjeseci u bolesnika sa STEMI-jem, tako ni u svih bolesnika s akutnim koronarnim sindromom bez ST elevacije, tikagrelor nije dostupan bez doplate, u tim mu je dijagnozama vrlo niska penetracija te su nužni daljnji naponi za promjenu takvoga stanja. Premda zasada preciznih podataka nema, penetracija lijekom obloženih potpornica na razini Republike Hrvatske općenito se procjenjuje na oko 40 %, što također zahtijeva pomake nabolje.

Zaključak

Uzimajući u obzir sve navedeno, unatoč vrlo dobrim rezultatima liječenja STEMI-ja u Republici Hrvatskoj koji su po

syndrome in Croatia, however, a number of data will not be included (e.g., percentage of fibrinolysis treated or non-reperfusion patients with acute STEMI, therapy and results of treatment in patients with acute coronary syndrome not treated with the methods of invasive and interventional cardiology, etc.). Such data will only be provided by the Registry of Acute Coronary Syndrome designed for a defined long-term purpose, which will also include all other Croatian hospitals along with PCI centers.

According to data from the current Registry, the number of myocardial infarction without ST-segment elevation cases treated by the methods of interventional cardiology within the first hours to days after coronary event is lower in comparison with STEMI cases. This in particular holds for hospitals where such treatment is not available, thus undoubtedly influencing the morbidity and mortality of these patients. This situation is generally caused by financial difficulties, calling for appropriate activities to change it in the near future.

In addition, there is also room for improvement in the organization of patient transport within the network. For example, the fast-track system generally does not work, with the exception of the Istria County and Krapina-Zagorje County, so that patients in the acute stage of myocardial infarction waste precious time for driving to the hospitals where interventional treatment is not available. In most cases, 12-lead ECG analysis is not available at the initial medical contact, i.e. in the ambulance or general medicine office, thus also wasting time to make the diagnosis and initiate treatment for this frequently life threatening condition. In an attempt to correct such illogical situations, the Working Group of Acute Coronary Syndrome takes active part in continuous education on this issue, intended for the physicians engaged in the network in all parts of Croatia. In 2015-2016, a simple graphic Algorithm for Diagnosis and Treatment of Acute Myocardial Infarction has been designed (**Figure 4**) and distributed to healthcare institutions all over Croatia.

In the last year, great breakthrough has been made in the availability of current antithrombotic therapy in Croatia. As it is known, prasugrel and ticagrelor currently are the antiplatelet drugs of choice in the treatment of acute myocardial infarction⁸⁻¹¹. While the former has not been registered in Croatia, since 2015 ticagrelor is available without payment to STEMI patients treated with PCI for the first six months postoperatively, thus having increased its penetration in STEMI in Croatia from 52% in the first half of 2015 to 79% in the first half of 2016. These data on the third-generation antiplatelet drug in STEMI are comparable to those reported from the most industrialized European countries. However, as after six months, ticagrelor is not available without copayment to STEMI patients and all patients with acute coronary syndrome without ST-segment elevation, its penetration is very low in these diagnoses, thus additional efforts should be invested to change this unfavorable situation. Although there are no precise data for now, penetration of the drug eluting stents at the national level has been estimated to around 40%, also requiring steps for improvement.

Conclusion

Considering all the facts mentioned above, there certainly is room for upgrading at all levels of acute coronary syndrome man-

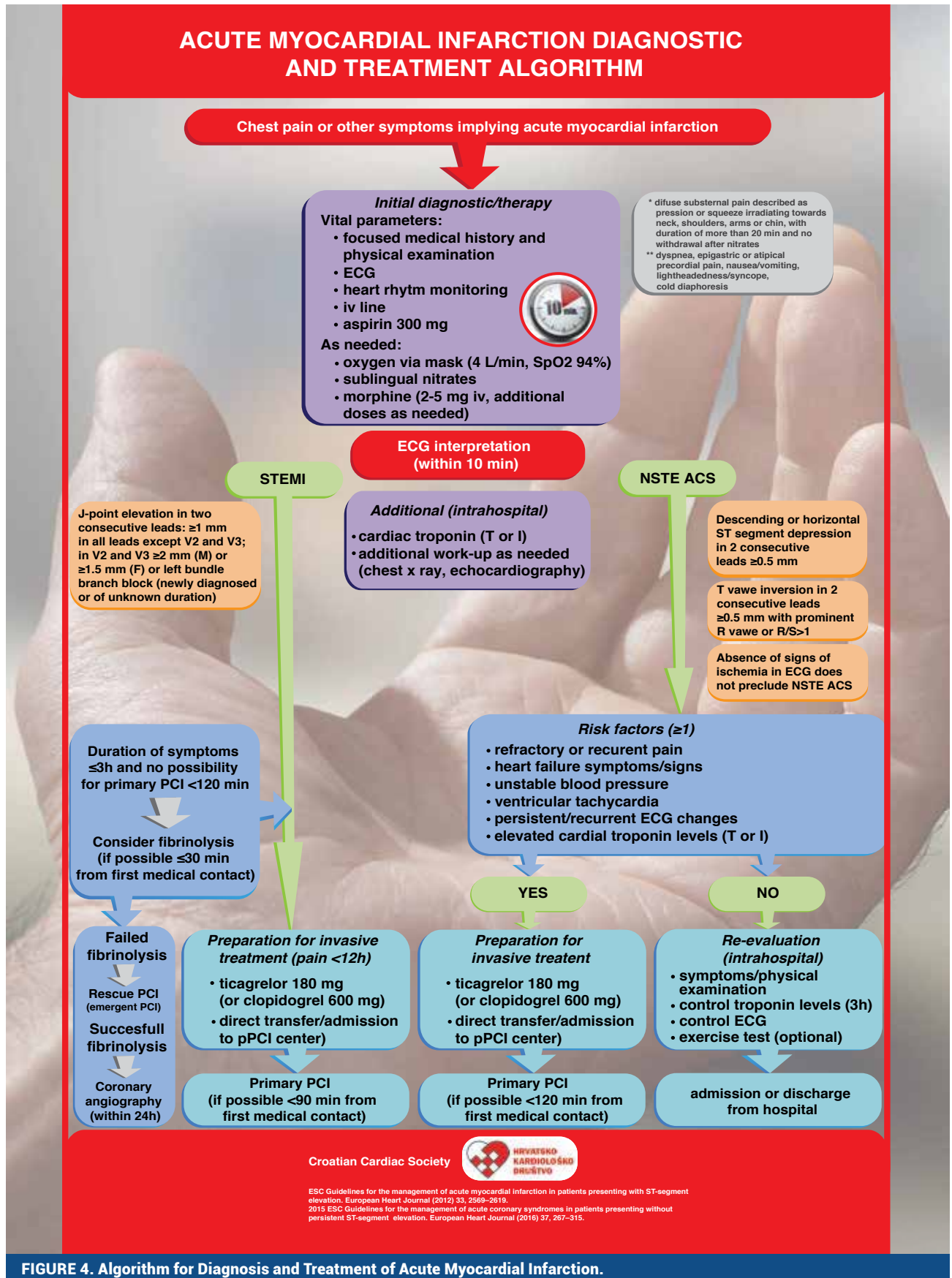


FIGURE 4. Algorithm for Diagnosis and Treatment of Acute Myocardial Infarction.

mnogome iznad prosjeka hrvatskoga zdravstva, jasno je da mjesta za napredak ima na svim razinama zbrinjavanja akutnoga koronarnog sindroma. Nastavkom entuzijastičnog i požrtvornog rada svih zdravstvenih djelatnika uključenih u liječenje ovoga stanja, ali i dodatnim ulaganjima u infrastrukturu, materijale, lijekove, edukaciju i ljudske resurse, ovakvi bi se solidni rezultati dodatno mogli poboljšati.

agement, in spite of the very good results achieved in the management of STEMI in Croatia, which considerably surpass the Croatian healthcare average. These superior results can be additionally improved by continuing enthusiastic and dedicated work of all health professionals involved in the treatment of this serious condition, but also by further investments in the infrastructure, materials, drugs, education and human resources.

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